

## **REMARKS**

This Amendment is submitted in reply to the Office Action dated June 24, 2003. Applicants respectfully request reconsideration and further examination of the patent application under 37 C.F.R. § 1.111.

Upon entry of the foregoing Amendment, claims 1 - 8, 10, 11 and 13 - 23 remain in the application. The amendments are believed to introduce no new matter, and their entry is respectfully requested. Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding rejections.

### **Summary of First Office Action**

- I. Claims 1 - 23 were rejected as being unpatentable over claims 1 - 8 of U.S. Patent No. 6,514,895 under the judicially created doctrine of obviousness type double patenting.
- II. Claims 1 - 15, 17, 18 and 20 - 23 were rejected under 35 U.S.C. 102 (a, e, g) as being anticipated by U.S. Patent No. 6,074,971.

### **Summary of Amendment**

Claim 1 was amended and claims 9 and 12 have been cancelled. The limitations of claims 9 and 12 have been added to claim 1.

Remarks regarding I:

Please find enclosed here with a terminal disclaimer with respect to U.S. Patent No. 6,514,895. Applicant submits with the submission of this terminal disclaimer, this rejection has been traversed.

Remarks regarding II:

Claims 1 - 15, 17, 18 and 20 - 23 were rejected under 35 U.S.C. 102 (a, e, g) as being anticipated by U.S. Patent No. 6,074,971.

With the present amendment, claim 1 now reads:

1. (Currently Amended) An electronically tunable dielectric material comprising at least one electronically tunable dielectric phase, wherein the at least one electronically tunable dielectric phase is selected from barium strontium titanate, barium titanate, strontium titanate, barium calcium titanate, barium calcium zirconium titanate, lead titanate, lead zirconium titanate, lead lanthanum zirconium titanate, lead niobate, lead tantalate, potassium strontium niobate, sodium barium niobate/potassium phosphate, potassium niobate, lithium niobate, lithium tantalate, lanthanum tantalate, barium calcium zirconium titanate, sodium nitrate, and combinations thereof, and a total of from about 1 to about 80 weight percent of at least two additional metal oxide phases, wherein the additional metal oxide phases comprise oxides of at least two metals selected from Be, Mg, Ca, Sr, Ba, Ra, Li, Na, K, Rb, Cs, Al, Zr, Zn, Fr, B, Fe, Mn, Cu, Cr, Ti, Ta, Nb, Mo, W, Ni, Pd, Pb, Bi, Si, Sn, Hf.

Applicant submits that the '971 patent provides ceramic ferroelectric composite materials comprising barium strontium titanate/magnesium and oxygen-containing compound composite further

doped with rare earth (lanthanide) oxides. Further, the composites are comprised of  $\text{Ba}_{1-x}\text{Sr}_x\text{TiO}_3$  /Mg--O based compound/rare earth oxide composite, wherein x is greater than or equal to 0.0 but less than or equal to 1.0, and wherein the weight ratio of BSTO to Mg compound may range from 99.75-20 wt. % BSTO to 0.25-80 wt. % Mg compound, and wherein said rare earth oxide additive comprises less than about 10 mole percent of the composite. The rare earth oxides of the composite include all oxides of the lanthanide series elements including scandium and yttrium, as well as combinations thereof. The magnesium-based compound may be selected from the group consisting of MgO,  $\text{MgZrO}_3$ ,  $\text{MgZrSrTiO}_3$ ,  $\text{MgTiO}_3$ , and  $\text{MgCO}_3$ .

The '971 disclosure requires ternary composites that contain BST + MgO+ Rare Earth. The background of the '971, however, does discuss that BSTO could be combined with various metal oxides (without the rare earth oxides) to produce ferroelectric composites having different and improved properties for particular applications. '971 provides patents that discuss this, such as U.S. Pat. No. 5,312,790 describing BSTO-alumina; U.S. Pat. No. 5,486,491 describing BSTO-zirconia; U.S. Pat. No. 5,635,433 describing BSTO-ZnO; U.S. Pat. No. 5,635,434 describing BSTO-magnesium based compounds.

As the Applicants of the present invention were, as well. primary inventors on the cited reference, they are experts on the material and limitations of the cited prior art as well as the art cited in the prior art. Through great amount of research and development, the Applicants of the present invention were able to greatly improve on the properties of the tunable dielectric and do so without the requirement of the addition of rare earth oxides. The Applicants went into great detail in the present invention on how if you combine at least one electronically tunable dielectric phase selected from barium strontium titanate, barium titanate, strontium titanate, barium calcium titanate, barium calcium zirconium titanate, lead titanate, lead zirconium titanate, lead lanthanum zirconium titanate,

lead niobate, lead tantalate, potassium strontium niobate, sodium barium niobate/potassium phosphate, potassium niobate, lithium niobate, lithium tantalate, lanthanum tantalate, barium calcium zirconium titanate, sodium nitrate, and combinations thereof, and a total of from about 1 to about 80 weight percent of at least two additional metal oxide phases, wherein the additional metal oxide phases comprise oxides of at least two metals selected from Be, Mg, Ca, Sr, Ba, Ra, Li, Na, K, Rb, Cs, Al, Zr, Zn, Fr, B, Fe, Mn, Cu, Cr, Ti, Ta, Nb, Mo, W, Ni, Pd, Pb, Bi, Si, Sn, Hf, the excellent performance characteristics were achieved - the performance characteristics which were set forth in great detail in the tables included in the present application.

Further, Applicants submit that it was not by mere chance that they discovered new properties of known material, but rather through a great amount of research and development determined that at least two metal oxides were needed (and selected from the aforementioned group) and they needed to be combined with the tunable dielectric phase selected from the group above. Thus, Applicants submit that the '971 does not teach, nor suggest the requirement of using at least two metal oxide phases and in the amounts set forth in the present application and with the material set forth in the present application.

Thus, Applicant submits that the rejection of claim 1 under 35 U.S.C. 102(b) has been traversed and, as claims 2 - 23 depend therefrom, those claim rejections should be traversed as well.

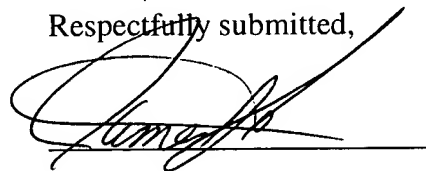
### CONCLUSION

From the foregoing, Applicants respectfully submit that all of the stated grounds of rejections have been properly traversed, accommodated, or rendered moot. Accordingly, Applicants respectfully request that the application is in condition for allowance and respectfully request such action.

If the Examiner believes, for any reasons, that personal communication will expedite prosecution of this application the Examiner is invited to telephone the undersigned at the following number: 202-607-4607. Further, if the Examiner believes that an Affidavit by the inventors of the cited art (Chiu and Sengupta) in support of the above remarks would substantiate the Applicant's position and expedite the allowance of the present application, Applicant will provide such an affidavit directly.

The USPTO is authorized to charge Deposit Account No. 502697 any fees associated with this response including the petition for the one month extension.

Respectfully submitted,



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